

Letters to the Editor . . .

Impressions from the Rural Health Conference

San Francisco

Editor, CALIFORNIA MEDICINE

Dear Sir:

It was my privilege to attend the second Rural Health Conference of the State of California held at Sacramento on October 16, 1948. I shall not try to review individual papers, as these probably will be published, but I did see in this meeting the possibility of a cooperative piece of work by medical personnel and others interested in health and welfare that could follow our American pattern of development and also remedy most of the ills of maldistribution of health in this vast country of ours where the problems are so numerous and difficult. It was ably pointed out by Mrs. I. H. Teilman that such a cooperative scheme should start at the local community, the small town, village or rural area that functions as a unit. The functioning body at that level should be a health council consisting of those individuals within the community who are concerned most vitally with health problems, namely the practicing physicians, dentists, the public health officer, the nurses, members of other health organizations such as Tuberculosis Association, Mental Hygiene Association, and other community organizations that have committees concerned with health and welfare such as the American Legion, civic and women's clubs. In some communities the health council may consist of only three or four individuals; in others it may be a much larger group. The function of such a council should be to study the local needs and strive for the fulfillment of those needs in every way possible whether this be through local pressure on city officials, whether it be legislative measures at a state or national level, or whether it be the activation of groups within its own community.

Upon the doctors and dentists rests the responsibility of studying their own needs, such as adequate hospital facilities, adequate laboratories and other essential equipment. These professional people, through the aid of the health council and its educational opportunities in the community, have a much greater chance of obtaining their objectives than without such aid. Requests from local groups of doctors to medical centers for diagnostic and educational help will hardly be refused. The medical schools and medical educators as well as other physicians in the large centers who are in active teaching and research have the organization or at least a basic pattern for expansion of its personnel to meet these demands. It should be recognized that medical edu-

cation is a continuous process and that people in medical education have a responsibility toward the practicing physician that is continuous throughout the period that a physician serves the health needs of his community. The larger medical centers, upon requests from local physicians, should furnish aid in laboratory diagnosis, x-ray diagnosis, consultations, ward rounds, lectures and medical conferences. Only in this way can the rural physicians discuss with specialists local problems at a local level. It should also be possible to bring many hospitals in the rural areas and small towns up to approved status where those young physicians who wish to practice in rural areas may have the benefit of seeing that rural practice in action while they are still in hospital training and where they may have the opportunity to participate in well child conferences and other rural or semi-rural health activities in the area. A better program for the training of general practitioners and rural practitioners could then be developed.

The role of nurses, both those working in a small hospital and those who are married and living in the community, and their cooperation to furnish adequate help to a hospital, was very ably presented by Mrs. Gabrielle T. Mulvane and should offer many suggestions to those interested in the acute shortage of nurses.

The health council can also make demands upon the local public health services, for this organization has a very definite responsibility to protect the general health of the community; particularly the safety of water supply, milk supply and prevention of diseases of animal origin that may be transmitted to man or from man to man. The public health service also serves an important function in its statistical studies of diseases. It is in a position to point out to the profession the needs and the possible solutions to those needs. Important in such statistics are infant and maternal mortality rates and prematurity. The demand from the rural areas on the one hand and the vision of the educators and public health services on the other should dovetail in such a manner that most areas of the state are covered with this network of medical care, thus retaining our pattern of individual endeavor, personal responsibility and cooperative effort without too great interference from either the state or the federal government.

What Margaret Mead in her book "Keep Your Powder Dry" stated concerning the country's military emergency might equally well apply to our health problems: "On the home front, every good sized community, every city, can tackle its own problems, get its own civilian defense going, organize its own housing and settle its own feeding problems

without waiting for Washington like so many helpless and spineless invalids waiting to be lifted from one deck chair into another." And in another place: "To win this war we need the impassioned effort of every individual in the country; to get that effort it will be necessary to throw the ball to the people of the small towns and the large, of the farms and the mines."

This type of solution to our health problems need not be a mere dream, the pattern is already set in a few areas; other communities need only to follow the example.

H. E. THELANDER, M.D.

384 Post Street.

E. Coli Antibiotic

The increasing difficulty of harmonizing classical immunologic theory with clinical data in enteric infections has led to renewed interest in earlier theories of enteric immunity. Thus, Shaughnessy⁶ and his associates infected adult human beings with graded oral doses of living, virulent *Shigella paradysenteriae* (Flexner) bacteria, about two weeks after having immunized them by subcutaneous injections with non-viable homologous vaccine. No significant clinical resistance was noted in these tests. Specific agglutinins, however, were found. Hardy³ conducted similar vaccination experiments in institutions caring for feeble-minded and psychotic patients where *Shigella* infections were prevalent. No significant clinical or bacteriological immunity was noted against the naturally occurring infection. The conclusion was drawn from both of these experiments that circulating antibodies play a negligible role in anti-dysentery immunity.

The earlier theories thus revised pictured enteric resistance as due largely to the antagonistic action of normal intestinal saprophytes. This theory was recently strengthened by the demonstration by Heatley and Florey⁴ of Oxford University, that certain strains of *E. coli* give off antibiotic substances which are both bacteriostatic and bacteriocidal against *Eberthella typhosa*, *Shigella shiga* and other enteric pathogens.

In order to throw light on the probable clinical role of such antibiotics, Halbert² of the University of North Carolina made a survey of the presence of antishiga strains of coliform bacilli in rectal cultures from 147 children under ten years of age in seven different towns in Hidalgo County, Texas. The specimens were obtained from presumably healthy subjects. In all, 1,243 coliform strains were isolated and tested for their inhibiting and bactericidal effects on *Shigella paradysenteriae* (Flexner III) grown on the surface of nutrient agar. Some of the organisms showed no antishiga effects whatsoever. About 8 per cent of them produced small zones of shigella inhibition up to 2 mm. wide. Ten per cent of the coliform strains produced inhibition zones as wide as 6 to 7 mm. Concentrations of human or rabbit blood as high as 25 per cent did not significantly affect the size of the inhibition zone.

A single case of acute diarrheal disease was studied with relation to the presence or absence of these antishiga coliforms. During the course of the disease there was a profound change in the coliform flora, in the direction of the development of organisms which showed an even greater degree of antagonism to the dysentery bacillus. This shift in the character of the flora paralleled the process of recovery, suggesting that the coliform bacilli played an important role in this recovery.

The prophylactic and therapeutic use of antibiotics produced by these coliform bacteria was suggested over 30 years ago by Nissle.⁵ The possibility of producing a usable antibiotic from such strains was therefore tested by Halbert² and his associates. They found that very low titer antibiotics were produced by growing coliform bacilli in deep broth. Very strong antibiotic titers were produced, however, by the same organisms when grown on the surfaces of 0.5 per cent nutrient agar. The yields were harvested after incubation at 37°C for 24 to 48 hours by one of the following methods: (a) The agar was allowed to thaw after rapid freezing in solid carbon dioxide. As much as one-half of the total volume of the agar was thus obtained as a crude liquor; (b) The agar was mashed by violent agitation and then centrifuged. About one-third of the total volume was thus obtained in fluid form; (c) the antibiotic was extracted by soaking the mashed agar for about one hour in distilled water.

The potency of the crude liquor obtained by the carbon dioxide method was often as high as 6,000 to 16,000 units on the penicillin scale. The crude antibiotic can be stored for as long as six months without deterioration. By adjusting its pH to 8, the crude product can be heated 100°C for 60 minutes or at 120°C at 15 pounds pressure for 15 minutes with only partial loss of titer.

The active component in the crude product is quantitatively precipitated by acetone or by 40 to 60 per cent saturation with ammonium sulfate, thus leading to a simple method for its concentration. Preliminary experiments show that the concentrate is relatively non-toxic. As much as 0.5 cc. of a concentrate containing 2,000,000 units of the antishiga antibiotic gives no recognizable symptoms when injected intraperitoneally into mice. Tests of the possible therapeutic use of this concentrate are now in progress.

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W. H. MANWARING
Stanford University
Palo Alto